Clinical Presentation, Prevalence and Management of Breast Cancer in Sokoto, Nigeria

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Abstract

**Background:** In recent times there have been increased cases of malignant breast diseases presenting to the surgical out-patient department of the Usmanu Danfodiyo University teaching hospital, Sokoto, Nigeria. The hospital receives referrals mainly from the neighboring state of Kebbi and occasionally from Zamfara. Unfortunately, majority of the patients present late with attendant poor outcome.

**Objectives:** To determine the clinical presentation, prevalence and management outcome of malignant breast diseases in Sokoto, Nigeria.

**Method:** A retrospective review of case notes of all patients with histologically confirmed breast diseases between 2007 and 2011 was carried out. Data studied included demographic characteristics, stage at presentation, management and follow up. Results were analyzed using the windows SPSS Statistics 17.0.

**Results:** A total of 1822 patients were seen, out of which 816 (44.8%) had malignant breast disease and 1006 (55.2%) had benign disease. 288 women had breast cancer in 2011 (98.8% and pre-existing cases) giving a prevalence rate of 10.4 cases per 100,000. The Male: Female ratio for breast cancer was 1:203. The mean and modal age group for breast cancer was 41-50 years. Invasive ductal carcinoma was responsible for 800 (88%) of cases seen. Invasive lobular carcinoma followed with 12 (1.5%) cases. 452 (55.4%) patients presented with stage 3C (T4B, N3, MO) disease while 359 (44.0%) patients presented with stage 4 (T4C, N3, M1) disease. Only 5 (0.6%) patients presented with stage 2B (T3A, N1B, MO) disease. No patient was seen with stage 1 disease during the five year study period. Modified radical mastectomy was offered to 414 (50.7%) patients, while 200 (24.5%) patients had toilet mastectomy. Immediate post-operative mortality was 0.8% (5 cases). However, 67 (8.2%) patients died before they were offered surgery. The overall mortality therefore was 9.0% (72 cases). Follow up studies showed that 402 (53.7%) patients were seen during the first year follow up, while 88(11.7%) patients were seen during the second year. No patient was seen in the third year of follow up.

**Conclusion:** The prevalence rate of breast cancer in Sokoto in 2011 was 10.4 per 100 000 women. Late presentation was the norm with 99.4% (811) presenting with advanced disease (TNM stages 3 and 4) and 0.6% (5) presenting with stage 2 disease. Breast cancer therefore continues to carry poor prognosis in this part of the country.

**Keywords:** Breast cancer; Late presentation; Women

Introduction

Breast cancer is the commonest female malignancy globally [1]. In Nigeria breast cancer has overtaken cervical cancer as the leading female malignancy [2]. It is also the commonest cancer among women in South Africa [3]. Breast cancer cases have increased in hitherto low incidence areas of Asia and Africa due to “Westernized lifestyle” and better reporting of the disease [4]. In Nigeria as in most developing countries, late presentation with unfavorable prognosis is common [5-7]. The African patient is likely to present with a more aggressive tumor than her Western counterpart and is likely to die from the disease [7]. Several works have shown that basal-like tumors occur significantly higher among pre-menopausal African-American and African women [8-11]. Ikpatt et al. [12] found that tumors of Nigerian women had less tubular differentiation and higher mitotic to apoptotic index compared to Finnish women. However these views are by no means universally accepted as recent works by several authors have shown that there was no difference in the pattern of hormone receptors in breast cancer patients of African origin compared to other populations [13]. They are of the view that the poor prognostic features of tumors of African origin are only a reflection of the late stage at diagnosis, non-availability of screening methods and the adverse influence of lack of awareness of the disease and some other epidemiological risk factors [13,14]. Breast cancer is therefore considered a complex and heterogeneous disease with ethnic and racial variations of histological subtypes and tumor behavior which must be clearly defined for maximal benefit to the patient [15,16]. The burden of management of breast cancer in a resource limited country like Nigeria weighs heavily on the patient who is likely to be poor, illiterate and has no form of health insurance. She is therefore forced to seek cheaper alternative treatment and only come to hospital as a last resort and with advanced disease.

Methodology

This was a retrospective study in which the case note of all patients with histologically confirmed neoplastic breast diseases seen in the surgical out-patient department of a tertiary hospital in north-western Nigeria, between 2007 and 2011 were retrieved and reviewed. Demographic characteristics, the clinical stage at presentation, management (including operative procedures and chemo-radiotherapy) and follow up of the patients were studied.

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Inclusion/exclusion criteria

All patients with histologically confirmed neoplastic breast diseases were included in the study. Patients with breast lesions not confirmed histologically and those with histologically confirmed non-neoplastic lesions were excluded from the study.

Staging characteristics

The TNM staging classification was used and clinical stages were grouped as: early stage (stages 1 and 2A), advanced (2B and 3C) and metastatic (stage 4). Bivariate analysis showed no significant relationship between age and clinical stage at presentation. Frequencies were presented as absolute values and percentages.

Receptor status

Measurement of receptor status was yet to commence at the time of the study and so no record of receptor status was seen in the case notes reviewed. All results were analyzed using the windows SPSS statistics 17.0.

Results

A total of 1822 patients were seen out of which 816 (44.8%) had malignant breast disease while 1006 (55.2%) had benign disease, giving a benign: malignant ratio of 1:2.1. Table 1 shows the overall distribution of malignant breast diseases in Sokoto over a 5 year period. There was an increasing trend in cases of breast cancer seen over the study period with 288 seen in 2011 (new-206 and pre-existing cases-82). The prevalence of breast cancer in 2011 was 10.4 per 100,000 women. The denominator for calculating prevalence was the population figure of 2,781,416 women from the 2006 population census for Sokoto and Kebbi states (the states served predominantly by the hospital). 4 male patients had Invasive ductal carcinoma giving a male: female ratio of 1:203.

The mean and modal age group was 41-50 years. Mean age was 48.2 years (Table 2). Invasive ductal carcinoma was the most commonly diagnosed histological type, 800(98%), followed by invasive lobular carcinoma, 12 (1.5%) (Table 2). 452 (55.4%) patients presented with TNM stage 3C (T4B, N3, M0) disease while 359 (44.0%) patients presented with stage 4 (T4C, N3, M1) disease. Only 5 (0.6%) patients presented with stage 2B (T3A, N1B, M0) disease. No patient was seen with stage 1 disease (Table 3). There was 100% positive axillary lymph node. There was no significant relationship between the clinical stage of breast cancer and the age of patients seen (p value > 0.05) (Table 4). Modified radical mastectomy was offered to 441 (54.0%) patients, while 200 (24.5%) patients had total mastectomy. All the patients operated were started on adjuvant chemotherapy using cyclophosphamide, doxorubicin and 5-fluoruracil but compliance was poor due mainly to financial difficulties. Patients were routinely placed on tamoxifen because the receptor status could not be determined. None however received monoclonal therapy. Neo-adjuvant chemotherapy was given to 311 (38.1%) patients to down-regulate the tumor while waiting for surgery, but none received neo-adjuvant radiotherapy. All the patients operated were referred for adjuvant radiotherapy. 5 (0.8%) patients died post-operatively from overwhelming tumor burden and multiple organ failure. However, 67 (8.2%) patients died before surgery (from metastatic disease). The overall mortality therefore was 5.0% (72) (Table 5). 402 (49.3%) patients were seen in the first year of follow up while 88 (10.8%) patients were seen in the second year. No patient was seen after the third year.

Discussion

The study shows that breast cancer constitutes 44.8% (816) of all breast diseases seen, while benign breast disease was 55.2% (1006). The benign: malignant (B:M) ratio was 1.2:1, in contrast to most reports in Nigeria where benign diseases predominates [17-20]. Ochicha et al. [17] in Kano noted that benign breast disease accounted for 71.9% of breast diseases in women with a B: M ratio of 2.6:1. Fibrocystic disease was the commonest histological type seen in that study comprising 34.3% (55) of all the cases, and with a mean age of 33 years. This was followed by fibroadenoma with 28.8% and mean age of 21 years [17]. Fibroadenoma was also the commonest benign breast disease in our study accounting for 95.4% (960) and with mean age range of 11-20 years [18-20].

The prevalence rate of breast cancer in 2011 from our study was 10.4 per 100,000 women. This is the first hospital based figure on breast cancer prevalence from our center. Most figures within and outside Nigeria suggest a rising incidence of breast cancer due largely to "Westernized lifestyle" and better reporting of the disease [4,21-23]. Jedy Agba et al. [24] reported an age standardized incidence rate (ASR) of breast cancer of 52.0 per 100,000 women in Ibadan, Nigeria and 64.6 per 100,000 women in Abuja, Nigeria and concluded that there was substantial increase (compared to previous studies) in incidence of breast cancer in Nigeria.

Breast cancer incidence in Uganda doubled from 11 per 100,000 women in 1961 to 22 per 100,000 women in 1995 [25]. The incidence in developed countries like the USA and UK is much higher ranging between 50 and 100 per 100,000 women and was responsible for up to 375,000 deaths in the USA in 2000 [26,27].

Globally, 1.4 million women were diagnosed with breast cancer in 2008 with approximately 459,000 deaths [28,29]. Of these approximately 450,000 were diagnosed with the disease in Europe with 140,000 deaths, while 68,000 women were diagnosed with the disease in Africa with corresponding 37,000 deaths [28,29].

The predominant histological type of invasive ductal carcinoma in our study is not different from other findings in the country and elsewhere [21,30,31]. The study also shows that breast cancer occur in younger age (mean age 48.2 years) among our women than in Caucasians [21]. Most published works in Nigeria and America reveal that breast cancer in African women occur a decade earlier than the western average [21,32,33]. African-American women also present at significantly younger age (mean age 48.2 years) among our women than in Caucasians [21]. Most published works in Nigeria and America reveal that breast cancer in African women occur a decade earlier than the western average [21,32,33]. African-American women also present at significantly younger age than their Caucasian counterparts [34,35].

Similarly, black British women presented significantly younger (median age of 46 years), than white patients (median age of 67 years) [36].

The factors responsible for this are not fully understood although it may be due to mutations in the breast cancer genes (BRCA 1 and 2)
and their variants [35]. A study in America shows that most African-American patients have mutations in BRCA 2 while mutations in the white women were in BRCA 1, and almost half of the African-American women had variants of uncertain significance compared to only 12% of the white cohorts [37]. Unfortunately, not much genetic work has been done on non-migrant African women. A Multi Centre research into the genetics of breast cancer among African women therefore may reveal mutations currently unknown.

The stage at presentation of breast cancer in this study was abysmal. No patient was seen with stage 1 disease in the 5 year study period. 99.4% presented with late disease (55.4%, stage 3c and 44.0% stage 4) and 0.6% (5) presented with stage 2b disease. There was 100% positive axillary lymph node.

This is the usual finding in most developing countries with attendant poor outcome [21,30,32]. Anyanwu in Nnewi, Nigeria reported 3% stage 1, 24% stage 2 and 72% advanced stage (68% stage 3 and 4% stage 4) while Ntekim et al. [21,30] in Ibadan, Nigeria got 24% stage 1, 24% stage 2 and 72% advanced stage (68% stage 3 and 4% stage 4). Ohene-Yeboah and Adjei [38] in Kumasi, Ghana reported that 85.2% (281) of patients presented with stages 3 and 4 disease; and 82.1% (225) were lost after the second year of follow up. The five year survival estimates for parts of Africa was 12% compared to 90% in the USA, Australia and Canada where cancers are detected early and patients have ready access to treatment [28]. Actual survival in this study was therefore difficult to determine because of the frequent loss of patients to follow up. The 5 year survival rates for patients with stages 1, 2, 3 and 4 breast cancer in a hospital in Brazil between 1990 and 1994 were 90%, 78.9%, 47.4% and 14.9% respectively [45]. The age-adjusted mortality rate for Argentina and Uruguay in 2004 was 20/100 000 and 24/100 000 respectively, with mean age at death from breast cancer being 66.4 years for Argentina and 63.2 years for Uruguay [46]. However, overall survival estimates for Latin America hardly exceeds 70% [46].

With the predicted rise in incidence of breast cancer in parts of Asia and Africa, due largely to "Westernized life style", the burden of management of breast disease will continue to pose a great challenge to the surgeon [28], and unless measures are put in place for early detection, and easy accessibility to treatment, the prognosis of breast cancer will continue to be poor in a resource limited economy like Nigeria.

Table 2: Histological diagnosis, age and sex distribution of patients seen over a 5 year period.

<table>
<thead>
<tr>
<th>Histologic Type Sex</th>
<th>M</th>
<th>F</th>
<th>M</th>
<th>F</th>
<th>M</th>
<th>F</th>
<th>M</th>
<th>F</th>
<th>M</th>
<th>F</th>
<th>M</th>
<th>F</th>
<th>M</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invasive ductal carcinoma</td>
<td>0</td>
<td>2</td>
<td>22</td>
<td>0</td>
<td>163</td>
<td>0</td>
<td>362</td>
<td>0</td>
<td>176</td>
<td>0</td>
<td>151</td>
<td>0</td>
<td>120</td>
<td>4</td>
</tr>
<tr>
<td>Invasive lobular carcinoma</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fibrosarcoma</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Malignant phyllodes tumor</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
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<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
<td>2</td>
<td>22</td>
<td>0</td>
<td>167</td>
<td>0</td>
<td>373</td>
<td>0</td>
<td>177</td>
<td>0</td>
<td>151</td>
<td>0</td>
<td>120</td>
<td>0</td>
</tr>
<tr>
<td>Grand total</td>
<td>2</td>
<td>22</td>
<td>168</td>
<td>373</td>
<td>178</td>
<td>52</td>
<td>21</td>
<td>816</td>
<td>816</td>
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</tr>
</tbody>
</table>

M= Males, F= Female

Table 3: TNM staging classification of patients seen during the 5 year study period.

<table>
<thead>
<tr>
<th>Staging (AJCC)</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>II A</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>II B</td>
<td>5</td>
<td>0.6</td>
</tr>
<tr>
<td>III A</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>III B</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>III C</td>
<td>452</td>
<td>55.4</td>
</tr>
<tr>
<td>IV</td>
<td>359</td>
<td>44.0</td>
</tr>
<tr>
<td>Total</td>
<td>816</td>
<td>100.0</td>
</tr>
</tbody>
</table>

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Table 5: Association between breast cancer stage and age of patients.

<table>
<thead>
<tr>
<th>Stage of Mortality</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-operative</td>
<td>67 (8.2)</td>
</tr>
<tr>
<td>Post-operative</td>
<td>5 (0.6)</td>
</tr>
</tbody>
</table>

Table 5: Mortality pattern of Breast cancer patients as seen in relation to the follow up with associated missing data made actual survival estimation sample size and longer period of evaluation. Frequent loss of patients to records department makes retrieval of case files earlier than 2007 a only way to reverse the trend.

Conclusion

The prevalence rate of breast cancer in Sokoto in 2011 was 10.4 per 100,000 women. Late presentation was the norm with 99.4% (811) presenting with advanced disease (stages 3 and 4) and 0.6% (5) presenting with stage 2 disease. Aggressive public health campaigns with emphasis on screening and easy accessibility to treatment is the presenting with stage 2 disease. Aggressive public health campaigns with emphasis on screening and easy accessibility to treatment is the only way to reverse the trend.

Limitations of the Study

The manual system of storage of information by the medical records department makes retrieval of case files earlier than 2007 a challenging task. A ten year study period would have meant a larger sample size and longer period of evaluation. Frequent loss of patients to follow up with associated missing data made actual survival estimation difficult in this study.

References